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## Tailor a comprehensive design of OneArgo for its European implementation

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The ocean plays a key role in the climate system, and therefore in the climate change threat. About 90% of the heat excess absorbed since the 1970's is stored in the ocean and changes in the hydrological cycle related to climate change are also strongly manifested in the ocean. In addition, the ocean acts as a net anthropogenic carbon sink, presently assessed as one fourth of the global uptake, and a moderator of climate change. It is therefore of paramount importance to monitor key ocean properties over long periods, with a global coverage.

Argo has transformed the way of ocean observing in the last decades and is the most important source of *in situ* marine data. As a major component of both the Global Ocean Observing System and the Global Climate Observing System, it provides near-real time data for forecasting and reanalysis services and high-quality data for climate research. Its implementation began in 1999, reaching a global coverage since 2007 (Roemmich *et al.* 2009). Originally designed to provide temperature and salinity profiles in the upper 2 000 m of the ice-free ocean (Core-Argo mission), the array has been expanded into seasonal ice zones (Polar-Argo mission), as well as in marginal seas. Successful pilot studies have shown the scientific added-value and the technology readiness to extend its mission towards greater depths (Deep-Argo mission) and biogeochemistry (BGC-Argo mission), hence the new "Global, full depth, multidisciplinary" OneArgo design defined after the OceanObs'19 Conference (Roemmich *et al.* 2019), aiming for a full implementation by 2030.

Euro-Argo ERIC (European Research Infrastructure Consortium) coordinates the European contribution to the Argo international programme, as the sum of European national contributions from 13 countries plus project-based contributions from the European Commission. This joint effort enables Euro-Argo to aim at maintaining  $\frac{1}{4}$  of the array, with a regional perspective leant towards marginal seas (Mediterranean, Black and Baltic seas) and the European part of the Arctic seas. It has thus become a major source of information for European operational centres such as the Copernicus Marine and Climate Services and the European Centre for Medium-Range Weather Forecasts (ECMWF). In addition, it provides important *in situ* information for calibration and validation of satellites, and the technological advances in biogeochemical instrumentation have greatly improved the ability to collect data that support marine policies set up by the European Union.

Within this context, Euro-Argo is currently revising its deployment strategy for the next decade, considering specific European needs, while integrating within the European Ocean Observing System and contributing to the international OneArgo new ambitious design. The new strategy will consider feedbacks received from Copernicus in the frame of the COINS and GEORGE HE and European In situ Alliance projects. It will also include first results of studies undertaken within the EA-ONE and TRICUSO HE projects to optimise Argo network efficiency, sustainability, and global impact through refined sampling strategies and regional collaboration, e.g. for float recoveries.

Key elements of this comprehensive design of OneArgo for its European implementation will then be presented.